

## AMENDMENTS TO THE CLAIMS

1           1.       (Currently Amended) A method of ~~consolidating~~ using a computer system  
2 to consolidate multiple configuration models ~~using an automated process~~, the method  
3 comprising:

4           identifying ~~determining if~~ a conflict ~~exists~~ between at least two of the  
5 configuration models, wherein the configuration models are organized in  
6 accordance with respective directed acyclic graphs, each configuration  
7 model includes at least one ancestor configuration model family space and  
8 a child configuration model family space below the ancestor configuration  
9 model family space, a first of the conflicting configuration ~~model~~ models  
10 comprises an ancestor configuration model family space that is different  
11 than an ancestor configuration model family space of a second of the  
12 conflicting configuration model, and each child configuration model  
13 family space constrains the ancestor configuration model family space  
14 above the child in accordance with configuration rules of the configuration  
15 model to which the child belongs ~~a configuration model that includes a~~  
16 ~~release of a product that is not released in at least a second conflicting~~  
17 ~~configuration model and the product is defined using the ancestor and~~  
18 ~~child configuration model families;~~

19       extending at least one of the ancestor configuration model family spaces of the  
20 conflicting configuration models so that the ancestor configuration model  
21 family spaces of the first and second conflicting configuration models  
22 represent the same ancestor configuration model family space ~~product in~~  
23 ~~the first conflicting configuration model to be compatible with second~~  
24 ~~conflicting configuration model;~~

25       removing from the child configuration model family space any configuration  
26 space extended in the ancestor of the child configuration family space  
27 ~~restricting child family in the first conflicting configuration model so that~~  
28 ~~the child family is not released in the extension of the ancestor family; and~~

29 combining the first and second configuration models into a single, consolidated  
30 model that maintains a non-cyclic chain of dependencies among families  
31 and features of families for use in answering configuration questions.

1 2. (Original) The method of claim 1 further comprising:  
2 detecting any inconsistencies between rules included in the consolidated model;  
3 and  
4 attempting to resolve any detected inconsistencies.

1 3. (Currently Amended) A computer system for consolidating multiple  
2 models, the system comprising:  
3 a processor; and  
4 a memory, coupled to the processor, having code stored therein and executable by  
5 the processor for:  
6 identifying ~~determining if~~ a conflict ~~exists~~ between at least two of the  
7 configuration models, wherein the configuration models are  
8 organized in accordance with respective directed acyclic graphs,  
9 each configuration model includes at least one ancestor  
10 configuration model family space and a child configuration model  
11 family space below the ancestor configuration model family space,  
12 a first of the conflicting configuration ~~model~~ models comprises an  
13 ancestor configuration model family space that is different than an  
14 ancestor configuration model family space of a second of the  
15 conflicting configuration model, and each child configuration  
16 model family space constrains the ancestor configuration model  
17 family space above the child in accordance with configuration  
18 rules of the configuration model to which the child belongs a  
19 ~~configuration model that includes a release of a product that is not~~  
20 ~~released in at least a second conflicting configuration model and~~  
21 ~~the product is defined using the ancestor and child configuration~~  
22 ~~model families;~~

extending at least one of the ancestor configuration model family spaces  
of the conflicting configuration models so that the ancestor  
configuration model family spaces of the first and second  
conflicting configuration models represent the same ancestor  
configuration model family space ~~product in the first conflicting~~  
~~configuration model to be compatible with second conflicting~~  
~~configuration model;~~  
removing from the child configuration model family space any  
configuration space extended in the ancestor of the child  
configuration family space ~~restricting child family in the first~~  
~~conflicting configuration model so that the child family is not~~  
~~released in the extension of the ancestor family;~~ and  
combining the first and second configuration models into a single,  
consolidated model that maintains a non-cyclic chain of  
dependencies among families and features of families for use in  
answering configuration questions.

4. (Currently Amended) A computer ~~program-product~~ readable medium  
having instructions encoded therein and executable by a processor to consolidate multiple  
models, the instructions comprising code for:  
identifying ~~determining~~ if a conflict exists between at least two of the  
configuration models, wherein the configuration models are organized in  
accordance with respective directed acyclic graphs, each configuration  
model includes at least one ancestor configuration model family space and  
a child configuration model family space below the ancestor configuration  
model family space, a first of the conflicting configuration model models  
comprises an ancestor configuration model family space that is different  
than an ancestor configuration model family space of a second of the  
conflicting configuration model, and each child configuration model  
family space constrains the ancestor configuration model family space  
above the child in accordance with configuration rules of the configuration

15                    ~~model to which the child belongs a configuration model that includes a~~  
16                    ~~release of a product that is not released in at least a second conflicting~~  
17                    ~~configuration model and the product is defined using the ancestor and~~  
18                    ~~child configuration model families;~~  
19                    extending at least one of the ancestor configuration model family spaces of the  
20                    conflicting configuration models so that the ancestor configuration model  
21                    family spaces of the first and second conflicting configuration models  
22                    represent the same ancestor configuration model family space product in  
23                    the first conflicting configuration model to be compatible with second  
24                    conflicting configuration model;  
25                    removing from the child configuration model family space any configuration  
26                    space extended in the ancestor of the child configuration family space  
27                    restricting child family in the first conflicting configuration model so that  
28                    the child family is not released in the extension of the ancestor family; and  
29                    combining the first and second configuration models into a single, consolidated  
30                    model that maintains a non-cyclic chain of dependencies among families  
31                    and features of families for use in answering configuration questions.

1                    5.        (Previously Presented)        The method of claim 1 wherein the  
2                    configuration models represent configuration models of vehicles.

1                    6.        (Previously Presented)        The method of claim 1 wherein the  
2                    consolidated model includes only buildable configurations.

1                    7.        (Currently Amended) The method of claim 1 wherein:  
2                    extending at least one of the ancestor configuration model family spaces of the  
3                    conflicting configuration models so that the ancestor configuration model  
4                    family spaces of the first and second conflicting configuration models  
5                    represent the same ancestor configuration model family space product in  
6                    the first conflicting configuration model to be compatible with second  
7                    conflicting configuration model further comprises:

8 extending a rule from the first ~~conflicting~~ configuration model into the  
9 ancestor configuration model family space; and  
10 removing from the child configuration model family space any configuration  
11 space extended in the ancestor of the child configuration family space  
12 ~~restricting child family in the first conflicting configuration model so that~~  
13 ~~the child family is not released in the extension of the ancestor family~~  
14 further comprises:  
15 repairing the extension of the rule in the child family.

1 8. (Currently Amended) The method of claim 1 wherein combining the first  
2 and second models into a single, consolidated model further comprises:  
3 loading the configuration models into a memory of the computer system;  
4 constructing a directed acyclic graph of all rules in all the configuration models;  
5 for each configuration model, determining which portions of an overall  
6 configuration space for which the configuration model does not provide a  
7 buildable configuration; and  
8 for each configuration model, constraining statements of the rules within the  
9 configuration model to fall within a space of defining features of the  
10 configuration model.

1 9. (Previously Presented) The method of claim 8 wherein determining which  
2 portions of an overall configuration space for which each configuration model does not  
3 provide a buildable configuration further comprises:  
4 determining which families are ancestors of families of defining constraints; and  
5 subtracting a right hand side and a left hand side of each rule of each family that  
6 are ancestors of families of defining constraints from a rule representing  
7 all buildable configurations.

1 10. (Previously Presented) The system of claim 3 further comprising code  
2 for:  
3 detecting any inconsistencies between rules included in the consolidated model;  
4 and

5 attempting to resolve any detected inconsistencies.

1 11. (Previously Presented) The system of claim 3 wherein the  
2 configuration models represent configuration models of vehicles.

1 12. (Previously Presented) The system of claim 3 wherein the  
2 consolidated model includes only buildable configurations.

1 13. (Currently Amended) The system of claim 3 ~~further comprising code for~~  
2 wherein:  
3 the code for extending at least one of the ancestor configuration model family  
4 spaces of the conflicting configuration models so that the ancestor  
5 configuration model family spaces of the first and second conflicting  
6 configuration models represent the same ancestor configuration model  
7 family space comprises code for extending a rule from the first conflicting  
8 configuration model into the ancestor ~~of a~~ family; and  
9 the code for removing from the child configuration model family space any  
10 configuration space extended in the ancestor of the child configuration  
11 family space comprises code for repairing the extension of the rule in the  
12 child family.

1 14. (Currently Amended) The system of claim 3 ~~further comprising the code~~  
2 for combining the first and second models into a single, consolidated model further  
3 comprises code for:  
4 loading the configuration models into a memory of the computer system;  
5 constructing a directed acyclic graph of all rules in all the configuration models;  
6 for each configuration model, determining which portions of an overall  
7 configuration space for which the configuration model does not provide a  
8 buildable configuration; and  
9 for each configuration model, constraining statements of the rules within the  
10 configuration model to fall within a space of defining features of the  
11 configuration model.

1           15.     (Currently Amended) The system of claim 14 ~~further comprising wherein~~  
2     the code for determining which portions of an overall configuration space for which the  
3     configuration model does not provide a buildable configuration further comprises code  
4     for:

5           determining which families are ancestors of families of defining constraints; and  
6           subtracting a right hand side and a left hand side of each rule of each family that  
7           are ancestors of families of defining constraints from a rule representing  
8           all buildable configurations.

1           16.     (Currently Amended) The computer ~~program-product~~ readable medium of  
2     claim 4 further comprising code for:

3           detecting any inconsistencies between rules included in the consolidated model;  
4           and  
5           attempting to resolve any detected inconsistencies.

1           17.     (Currently Amended) The computer ~~program-product~~ readable medium of  
2     claim 4 wherein the models represent configuration models of vehicles.

1           18.     (Currently Amended) The computer ~~program-product~~ readable medium of  
2     claim 4 wherein the configuration models represent configuration models of vehicles.

1           19.     (Currently amended) The computer ~~program-product~~ readable medium of  
2     claim 4 ~~further comprising code for~~ wherein:

3           the code for extending at least one of the ancestor configuration model family  
4           spaces of the conflicting configuration models so that the ancestor  
5           configuration model family spaces of the first and second conflicting  
6           configuration models represent the same ancestor configuration model  
7           family space comprises code for extending a rule from the first conflicting  
8           configuration model into the ancestor ~~of a~~ family; and  
9           the code for removing from the child configuration model family space any  
10          configuration space extended in the ancestor of the child configuration

11                    family space comprises code for repairing the extension of the rule in the  
12                    child family.

1            20.    (Currently Amended) The computer ~~program-product~~ readable medium of  
2            claim 4 ~~further comprising the code for~~ combining the first and second models into a  
3            single, consolidated model further comprises code for:  
4                    loading the configuration models into a memory of the computer system;  
5                    constructing a directed acyclic graph of all rules in all the configuration models;  
6                    for each configuration model, determining which portions of an overall  
7                    configuration space for which the configuration model does not provide a  
8                    buildable configuration; and  
9                    for each configuration model, constraining statements of the rules within the  
10                   configuration model to fall within a space of defining features of the  
11                   configuration model.

1            21.    (Currently Amended) The computer ~~program-product~~ readable medium of  
2            claim 20 ~~further comprising wherein the code for~~ determining which portions of an  
3            overall configuration space for which the configuration model does not provide a  
4            buildable configuration further comprises code for:  
5                    determining which families are ancestors of families of defining constraints; and  
6                    subtracting a right hand side and a left hand side of each rule of each family that  
7                    are ancestors of families of defining constraints from a rule representing  
8                    all buildable configurations.

1            22.    (Currently Amended) A computer system for performing an automatic  
2            consolidation of multiple models of configurable products, the system comprising:  
3                    means for ~~identifying determining if a conflict exists~~ between at least two of the  
4                    configuration models, wherein the configuration models are organized in  
5                    accordance with respective directed acyclic graphs, each configuration  
6                    model includes at least one ancestor configuration model family space and  
7                    a child configuration model family space below the ancestor configuration  
8                    model family space, a first of the conflicting configuration ~~model~~ models



9 comprises an ancestor configuration model family space that is different  
10 than an ancestor configuration model family space of a second of the  
11 conflicting configuration model, and each child configuration model  
12 family space constrains the ancestor configuration model family space  
13 above the child in accordance with configuration rules of the configuration  
14 model to which the child belongs ~~a configuration model that includes a~~  
15 ~~release of a product that is not released in at least a second conflicting~~  
16 ~~configuration model and the product is defined using the ancestor and~~  
17 ~~child configuration model families;~~

18 means for extending at least one of the ancestor configuration model family  
19 spaces of the conflicting configuration models so that the ancestor  
20 configuration model family spaces of the first and second conflicting  
21 configuration models represent the same ancestor configuration model  
22 family space ~~product in the first conflicting configuration model to be~~  
23 ~~compatible with second conflicting configuration model;~~

24 means for removing from the child configuration model family space any  
25 configuration space extended in the ancestor of the child configuration  
26 family space ~~restricting child family in the first conflicting configuration~~  
27 ~~model so that the child family is not released in the extension of the~~  
28 ~~ancestor family; and~~

29 means for combining the first and second configuration models into a single,  
30 consolidated model that maintains a non-cyclic chain of dependencies  
31 among families and features of families for use in providing an answer to  
32 configuration questions.